

Wildcat (00)
TD 4030 in "Reed City" (33)
Dry Hole

30-17N-8W
Evart Twp. (Osceola Co.)

Michigan Consolidated Gas Company

H. Maddern No. 1

Permit No. 27159

Drilling Contractor: Michigan Consolidated Gas Company (Rotary 0-4030)

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 30, T17N, R8W
940' from north and 990' from west line of quarter section

Elevation: 1160.5' above sea level (rot. bush.)

Record by: H. Laaksonen from driller's log & sample log submitted by the company.
Logs run: Schlumberger Laterolog-Gamma Ray-Neutron (20-4025) & Compensation
Formation Density Log 912-4020) (Sj)

| | Thickness (feet) | Depth (feet) |
|--------------------------------|---------------------|-----------------|
| Cenezoic Era | | |
| PLEISTOCENE: | | |
| Drift: | | |
| Clay | 75 | 75 |
| Drift, clay, with sand streaks | 177 | 252 |
| Clay and gravel | 313 | 565 |
| Shale, gray | 27 | 592 |
| | (592) | |

| | | |
|------------------------------|------|-----|
| Mesozoic Era: | | |
| JURASSIC: | | |
| Kimeridgian: | | |
| Red clay and gypsum | 33 | 625 |
| Limestone, shells and gypsum | 20 | 645 |
| | (53) | |

| | | |
|---|-----|-----|
| Paleozoic Era | | |
| PENNSYLVANIAN-MISSISSIPPIAN: | | |
| Saginaw-Bayport: | | |
| Clay and sand | 145 | 790 |
| Shale, reddish brown, sticky, sand and gravel contamination | 10 | 800 |
| Shale, reddish brown, plastic, soft | 10 | 810 |
| Shale as above; clay, gray | 10 | 820 |
| Shale 60% reddish as above; sandstone 40% gray, 0.1-0.2 mm grain size, subrounded, medium cemented with dolomite, well sorted | 10 | 830 |
| Free sand grains 80% and some pieces of sandstone, frosted, 0.2-0.4 mm grain size, subrounded, sample looks gray; shale 20% dark gray | 10 | 840 |
| Shale 60% dark gray; dolomite 10% dark brown, microcrystalline trace; sandstone 30% gray, 0.1 mm grain size, subrounded, well cemented with dolomite, white | 10 | 850 |
| Shale, dark gray; sandstone, off white, 0.1-0.25 mm grain size, fair sorting, subrounded, poorly cemented; sandstone seems to be interbedded with shale, gray and siltstone, gray | 10 | 860 |
| As above, slight increase sandstone | 10 | 870 |
| Sandstone, off white, 0.1-0.2 mm grain size, subangular, well sorted, fair cemented with dolomite, shale, trace, gray | 30 | 900 |

| | Thickness (feet) | Depth (feet) |
|---|---------------------|-----------------|
| Saginaw-Bayport Continued: | | |
| Sandstone, off white and free sand grains, 0.1-0.3 mm grain size, subrounded, fair cemented with dolomite, medium sorted | 15 | 915 |
| Shale 50% gray, silty; siltstone 50% gray | 5 | 920 |
| Sandstone, off white 70%, 0.1-0.15 mm grain size, subangular, well sorted, fair cemented with lime; shale 30% gray | 10 | 930 |
| Shale 50% black, hard; sandstone 40% off white, 0.2-0.4 mm grain size, subrounded, poorly cemented with dolomite, poor sorting, porous; dolomite 10% tan-brown, microcrystalline, sandy | 20 | 950 |
| Sandstone, off white, 0.1 mm grain size, well sorted, subangular, well cemented with white dolomite; dolomite, trace, brown very finely sucrosic | 10 | 960 |
| Shale, black | 10 | 970 |
| Shale, dark gray; dolomite, trace, brown, microcrystalline | 20 | 990 |
| Shale, light gray, hard, silty | 10 | 1000 |
| Shale, as above; dolomite 10% buff-brown, microcrystalline | 10 | 1010 |
| Shale, dark gray; dolomite, trace, buff-brown, microcrystalline | 90 | 1100 |
| Shale, dark gray | 90 | 1190 |
| Limestone, brown, microcrystalline, many included sand grains | 10 | 1200 |
| Limestone, brown | 10 | 1210 |
| Limestone 60% brown; sandstone 40% off white, 0.2-0.8 mm grain size, subangular, medium cemented with lime, medium sorted | 10 | 1220 |
| Limestone, brown; shale, gray; sandstone, trace as above | 5 | 1225 Sj |
| | (580) | |

MISSISSIPPIAN:

Michigan:

| | | |
|---|----|------|
| Shale 70% gray; anhydrite 30% white; dolomite, trace, gray, microcrystalline | 15 | 1240 |
| Shale, gray; anhydrite 20% white | 10 | 1250 |
| Shale 75% gray; anhydrite 20-25% white | 50 | 1300 |
| Shale, gray; anhydrite 20-25% white and pink | 50 | 1350 |
| As above, increase anhydrite, pink (triple gypsum @1368 Sj) | 20 | 1370 |
| Anhydrite, white | 10 | 1380 |
| Anhydrite 50% white; shale 50% gray | 10 | 1390 |
| Shale 70% gray; anhydrite 30% white | 5 | 1395 |
| Shale 80% gray; anhydrite 20% white | 5 | 1400 |
| Shale 60% gray; anhydrite 40% white | 10 | 1410 |
| Shale 75% gray; anhydrite 25% white | 5 | 1415 |
| Shale 85% gray; anhydrite 15% white | 5 | 1420 |
| Shale 90% gray; anhydrite 10% white | 5 | 1425 |
| Shale 75% gray; anhydrite 25% white | 5 | 1430 |
| Shale 65% gray; anhydrite 15% white; dolomite 20% brown, microcrystalline | 5 | 1435 |
| Shale 80% gray; dolomite, trace as above; anhydrite 20% white (brown limestone 1437 Sj) | 5 | 1440 |
| Anhydrite 80% white, shale, trace, -ray; limestone 20% brown, microcrystalline | 5 | 1445 |
| Dolomite 85% brown, finely sucrosic; anhydrite 15% white; shale, trace, gray | 5 | 1450 |
| Dolomite, brown as above; anhydrite, trace, white; shale, trace, gray | 5 | 1455 |
| Dolomite 80% brown as above; shale 20% gray | 5 | 1460 |
| Dolomite 70% brown; shale 30% gray | 5 | 1465 |

| | Thickness (feet) | Depth (feet) |
|--|---------------------|-----------------|
| Michigan Continued: | | |
| Shale 80% gray; dolomite 20% brown, microcrystalline; anhydrite, trace, white | 5 | 1470 |
| Shale, gray; anhydrite 20% white | 5 | 1475 |
| Shale 80% gray; silstone 20% gray; anhydrite, trace, white | 5 | 1480 |
| Sandstone 40% off white, 0.15-0.4 mm grain size, angular, poorly sorted, fair cemented with lime; shale 60% gray | 5 | 1485 |
| Sandstone 50% as above; shale 50% gray | 5 | 1490 |
| No samples | 10 | 1500 |
| Shale 70% gray; anhydrite 30% white | 5 | 1505 |
| Shale 90% gray; anhydrite 10% white | 5 | 1510 |
| Anhydrite, white; shale, trace, white | 5 | 1515 |
| Shale 90% gray; anhydrite 10% white | 15 | 1530 |
| Anhydrite 50% white; shale 50% gray | 5 | 1535 |
| Shale 60% gray; anhydrite 40% white; dolomite, trace, brown, microcrystalline | 5 | 1540 |
| Sandstone 30% green, 0.15-0.2 mm grain size, subangular, well cemented with dolomite, well sorted; shale 50% gray; anhydrite 20% white; dolomite, trace, brown, microcrystalline | 5 | 1545 |
| Sandstone 50% gray, 0.15-0.2 mm grain size, subangular, well sorted, medium cemented with lime; shale 50% dark gray | 5 | 1550 |
| Sandstone, as above (stray @1553 Sj) | 6 | 1556 |
| DST #1: 1524-1556 | | |
| Gas to surface 3 mins. | | |
| Flow time: 1st 30 mins 2nd 60 mins. | | |
| CIP time: 1st 60 mins 2nd 180 mins. | | |
| IHMP 739.1# FHMP 759.1# | | |
| ICIP 578# FCIP 578# | | |
| IFP 66.3#-94.7# | | |
| FFP 94.7#-90# | | |
| Tool opened with good blow for 30 mins. Int. flow rotated dual CIP valve for a 60 min. Int. CIP, reopened tool with good blow for 60 mins., second flow closed dual CIP valve for 180 mins FCIP. | | |
| Recovered: 100' drilling fluid and 500 MCF gas | | |
| Sandstone, gray as above | 4 | 1560 |
| Shale, gray | 5 | 1565 |
| Sandstone 60% gray; shale 40% gray | 15 | 1580 |
| Sandstone, red, 0.15-0.25 mm grain size, subangular and subrounded, fair cemented with dolomite, well sorted | 20 | 1600 |
| Sandstone, red as above, mostly free sand grains | 15 | 1615 |
| Sandstone as above, becoming shaley | 5 | 1620 |
| Sandstone 60% as above; shale 40% red, soft, plastic | 5 | 1625 |
| Shale, red, plastic; some sandstone, red | 15 | 1640 |
| Shale, gray, plastic; some sand grains | 10 | 1650 |
| As above | 6 | 1656 Sj |
| | (431) | |
| Marshall: | | |
| Sandstone, gray, 0.15-0.3 mm grain size, subangular and subrounded, fair sorting, fair cemented with dolomite | 44 | 1700 |
| As above | 15 | 1715 |
| Free sand grains, gray and red, frosted, 0.15-0.3 grain size, subangular | 10 | 1725 |

Thickness Depth
 (feet) (feet)

Marshall Continued:

| | | |
|--|-------|---------|
| Free sand grains as above, mostly reddish grains, 0.2-0.5 mm size, subangular | 40 | 1765 |
| Free sand grains, red, silty, 0.1 mm grainsize, subangular | 20 | 1785 |
| Free 40% sand grains as above; free sand 20% grains, gray, coarse, subangular; shale 40% gray | 5 | 1790 |
| Free sand grains 60% red, fine grained; free sand grains 10%, coarse, subangular; shale 30% gray | 5 | 1795 |
| Free sand grains 80% red, fine grained; free sand grains 20%, coarse, subangular | 20 | 1815 |
| Sandstone 70% reddish, silty, very fine grained; shale 30% reddish silty | 20 | 1835 |
| Shale, gray, medium hard | 10 | 1845 |
| Sandstone, reddish, silty, very fine grained, limey, micaceous | 21 | 1866 Sj |
| | (210) | |

Coldwater:

| | | |
|--|-------|---------|
| Shale, 90%, gray; limestone 10% brown, microcrystalline | 234 | 2100 |
| Shale 90% gray; dolomite 10-20% gray and brown, microcrystalline | 130 | 2230 |
| Shale 70% gray; dolomite 30% brown, limey, microcrystalline | 10 | 2240 |
| Shale 80% gray; dolomite 20% as above | 30 | 2270 |
| Shale 90% gray; dolomite 10% as above | 80 | 2350 |
| Shale 80% gray; dolomite 20% brown, microcrystalline | 10 | 2360 |
| Shale 90% gray; dolomite 10% brown, microcrystalline (Coldwater R.R. @2582 Sj) | 234 | 2594 Sj |
| | (728) | |

Sunbury:

| | | |
|--|------|---------|
| Shale 50% black, hard; limestone 20% cream, microcrystalline; shale 30% gray | 66 | 2660 |
| Shale 60% black; limestone 30% cream; shale 10% gray | 10 | 2670 |
| As above, fossil fragments | 18 | 2688 Sj |
| | (94) | |

Ellsworth:

| | | |
|---|-------|---------|
| Shale 60% black, hard; limestone 20% cream-gray, microcrystalline; shale 20% gray | 22 | 2710 |
| Shale 70% black; limestone 30% as above | 20 | 2730 |
| Shale, black, hard | 10 | 2740 |
| Shale 60% black; shale 40% gray green, hard | 10 | 2750 |
| Shale 70% gray green; shale 30% light brown | 50 | 2800 |
| Shale, gray green and some light brown | 70 | 2870 |
| As above, slight increase shale, light brown | 30 | 2900 |
| Shale 50% gray green; shale 50% light brown | 40 | 2940 |
| Shale 60% light brown; shale 40% gray green | 10 | 2950 |
| Shale 80% light brown; shale 20% gray-green | 50 | 3000 |
| Shale 90% light brown; shale 10% gray green | 80 | 3080 Sj |
| | (392) | |

MISSISSIPPIAN-DEVONIAN:

Antrim:

| | | |
|---|----|------|
| Shale, dark brown, blackish, hard | 85 | 3165 |
| Limestone 80% brown, microcrystalline; shale 20% dark brown as above; limestone, trace, cream, microcrystalline | 5 | 3170 |
| Shale 70% dark brown; limestone 30% brown as above | 5 | 3175 |
| Limestone 60% brown as above; shale, dark brown | 5 | 3180 |

| | Thickness (feet) | Depth (feet) |
|---|---------------------|-----------------|
| Antrim Continued: | | |
| Limestone 80% brown as above; shale 20% dark brown | 5 | 3185 |
| Shale 80% dark brown; limestone 20% brown, as above | 5 | 3190 |
| As above | 10 | 3200 |
| Shale 90% dark brown; limestone 10% as above | 10 | 3210 |
| Shale, dark brown | 41 | 3251 Sj |
| | (171) | |

DEVONIAN:

Traverse Formation:

| | | |
|--|------|---------|
| Shale, dark brown (more of a gray color); shale, trace, gray, limey; limestone, trace, white, microcrystalline | 34 | 3285 |
| Limestone, gray-brown, microcrystalline; shale, gray brown, limey | 10 | 3295 |
| Limestone, brown, microcrystalline, shaley | 10 | 3305 Sj |
| | (54) | |

Traverse Limestone:

| | | |
|--|-------|---------|
| Limestone, brown, very finely sucrosic-microcrystalline | 5 | 3310 |
| Limestone, brown, finely sucrosic (30 min. circulated sample at 3310) | | |
| Limestone, brown, sucrosic | 5 | 3315 |
| Limestone, gray-brown, sucrosic | 5 | 3320 |
| Limestone, brown, sucrosic | 5 | 3325 |
| Limestone, brown, sucrosic; shale, trace, grayish | 5 | 3330 |
| Limestone, brown, sucrosic; shale 30% grayish (30 min. circulated sample at 3330) | | |
| Limestone 40% black, microcrystalline; shale 40% gray brown; limestone 20% brown, sucrosic | 5 | 3335 |
| Limestone, off white, microcrystalline, fragmental | 5 | 3340 |
| Limestone, off white and buff, fragmental, sucrosic, cherty | 5 | 3345 |
| Limestone, buff-cream, fragmental | 15 | 3360 |
| Limestone, buff-brown, sucrosic | 15 | 3375 |
| Limestone, buff-brown, sucrosic | 35 | 3410 |
| Limestone, tan-brown, some buff-off white, sucrosic | 15 | 3425 |
| Limestone, tan-brown, sucrosic | 15 | 3440 |
| Limestone, off white, sucrosic | 15 | 3455 |
| Limestone, 80% off white, sucrosic; limestone 20% cream-buff | 5 | 3460 |
| Limestone, buff-tan, sucrosic | 30 | 3490 |
| Limestone, brown, sucrosic (3497 DPM=3497 SDP) | 45 | 3535 |
| Limestone 70% brown, sucrosic; limestone 30% buff-tan | 10 | 3545 |
| Limestone, light brown, sucrosic; limestone, trace, off white-buff | 105 | 3650 |
| Limestone 50% dark brown-black, microcrystalline; limestone 50% tan-brown, sucrosic | 40 | 3690 |
| Limestone 60% off white, sucrosic; limestone 40% black, microcrystalline | 10 | 3700 |
| Limestone 70% buff-tan, sucrosic; limestone 20% black, microcrystalline; shale 10% gray | 10 | 3710 |
| As above, darker color | 30 | 3740 |
| As above, plus shale, gray | 10 | 3750 |
| Limestone, brown, finely sucrosic; limestone, trace, off white, sucrosic (Bell Shale @3834 Sj) | 84 | 3834 |
| Limestone 50% as above; shale 50% gray | 16 | 3850 |
| As above, quite shaley | 25 | 3875 |
| Shale, gray | 15 | 3890 Sj |
| | (585) | |

BELL
 SHALE

Thickness Depth
 (feet) (feet)

Dundee-Detroit River (?): DUNDEE TOP 3890

| | | |
|--|--------|------|
| Limestone, off white-tan-brown, mottled, fragmental, finely sucrosic, fossiliferous; shale, gray (circulated sample at 3896) | 6 | 3896 |
| Limestone, as above; shale, gray | 4 | 3900 |
| Limestone as above | 10 | 3910 |
| Limestone, buff-brown as above (60 min. circulated sample at 3910) | | |
| Limestone, as above, buff-brown mottled | 53 | 3963 |
| Limestone 60% as above; dolomite 40% buff-gray, finely sucrosic (RCA @3963 Sj) | 5 | 3968 |
| Dolomite, dark brown, sucrosic; dolomite, gray, microcrystalline to finely sucrosic; anhydrite, trace, white? (RCD @3968 Sj) | 7 | 3975 |
| Dolomite, brown, finely sucrosic | 5 | 3980 |
| As above; anhydrite, trace, white? | 5 | 3985 |
| Dolomite, brown, sucrosic; chert, trace, white; anhydrite, trace white? | 5 | 3990 |
| Dolomite, cream, dense, tight | 5 | 3995 |
| Dolomite, tan, dense, tight | 5 | 4000 |
| Dolomite, as above, trace dolomite, brown to dark brown, micro-sucrosic, tight | 25 | 4025 |
| Dolomite, brown-dark brown, fine-microcrystalline, tight | 5 | 4030 |
| | (104+) | |

Total depth 4030

Casing record:
 8-5/8" 914 (500 cem.)

Commenced: 1-31-68
 Completed: 2-22-68
 Well Completed: 2-27-68

Initial production: dry hole

plk
 2/3/70

From REED CITY TOP To AMHERSBURG TOP
 is \approx 1050' (avg. of other wells)

AMHERSBURG TOP \approx 5,013 ft.
 to the MADDERN #1 WELL.

REED CITY
 TOP
 3963